

NEARCTIC SPECIES OF THE WOLF SPIDER
GENUS *TROCHOSA* (ARANEAE: LYCOSIDAE)*

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This is the first in a projected series of systematic studies of the Nearctic Lycosidae described in the genera *Trochosa* and *Lycosa*. One important aspect of the proposed series of revisions will be an attempt to delimit generic taxa within the Lycosidae, with special reference to Nearctic species. Over 50 species of North American *Lycosa* have been described and most of the medium to large-bodied wolf spiders are included in this genus at present. However, preliminary studies indicate that several distinct species groups, which may well represent different genera, have been assembled under *Lycosa*. Before undertaking the larger and more complicated task of delimiting genera within the *Lycosa* complex, it seemed logical to gain some idea of generic limits—to develop a yardstick whereby the species groups of *Lycosa* could be measured. *Trochosa* is represented by a small, relatively well-defined, widespread group of species. This genus might well serve as a model and yardstick for the study of *Lycosa* and I thought it practical to begin here.

The genus *Trochosa* is represented by five species in the Nearctic Region. One of the species, *T. terricola*, is quite common in Western and Central Europe (Locket and Millidge 1951, Engelhardt 1964, Fuhn and Burlacu 1971) and very likely occurs throughout the temperate parts of the Holarctic Region. The other four species comprise a distinct group that is probably restricted to North America. *Trochosa avara* occurs from the eastern coast westward to the 100th parallel, while *Trochosa gosiuta* is found in the southwestern United States (Map 2). *Trochosa shenandoa* occurs along the Atlantic and Gulf coasts and extends inland in the central United States as far as Kansas and possibly Illinois (Map 3). *Trochosa parthenus* appears in the southeastern United States and is the only species found in the Florida peninsula (Map 3).

North American species of *Trochosa*, with the exception of *shenandoa*, have been relegated to the genus *Lycosa* at one time or

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another. They do share some features with certain members of that large aggregate, but can be grouped together and distinguished from other lycosids on the basis of characteristics delineated in the preliminary diagnosis of the genus and the discussion of species groups.

Trochosa C. L. Koch

Trochosa C. L. Koch, 1848: 95; 1851: 33. Type species by original designation *Arenea ruricola* DeGeer, 1778. Keyserling 1877: 610. Scudder 1882: 328. Marx 1890: 564. McCook 1894: 90, 100, 107, 112, 118. Montgomery 1904: 300. Banks 1905: 319. Petrunkevitch 1928: 250.

Trochosina Simon, 1885: 10 (subgenus of *Trochosa*). Type species by original designation *Trochosa terricola* Thorell, 1856. Roewer 1954: 302 (raised to generic status).

Varacosa Chamberlin and Ivie, 1942: 36 (subgenus of *Trochosa*). Type species by original designation *Trochosa avara* Keyserling, 1877. Roewer 1954: 304 (raised to generic status). NEW SYNONYMY.

Allohogna (part). Roewer, 1954: 212.

Allotrochosina Roewer, 1954: 213. Type species by monotypy. *Lycosa maunganuiensis* Berland, 1925 (misspelled *mananganuiensis* by Roewer).

Diahogna Roewer, 1954: 239. Type species by monotypy *Lycosa martensii* Karsch, 1878.

Trochosomma Roewer, 1954: 304. Type species by original designation *Trochosa annulipes* L. Koch, 1875.

Discussion. For a more complete listing of synonyms of *Trochosa* by European authors refer to Bonnet (1959: 4698-4699). *Trochosina* Simon, *Allotrochosina* Roewer, and *Diahogna* Roewer were synonymized by Guy (1966) and his findings are supported here. *Trochosomma* Roewer was synonymized by McKay (1979).

Characteristics. Small to medium size spiders (total length 5.8 to 13.0 mm). Carapace length 3.2 to 5.9 mm; width 2.4 to 4.3 mm.

Color brownish yellow to dark brown with a lighter submarginal stripe on each side of the carapace and a broad median light stripe as in Figures 1-6. Within the light median stripe appears a pair of dark short stripes or dashes as in Figures 1, 2, 3, 5, 6. *Trochosa gosiuta* (Fig. 4) is the only species that does not show these dashes so characteristic of the genus. With this exception the dorsal pattern is similar throughout the genus. Abdomen yellowish brown to brown ground color with darker brown or black markings; sometimes with indistinct chevrons, but mostly mottled as in Figures 1-6.

Eyes: Anterior median eyes (AME) larger than anterior lateral eyes (ALE). Posterior median eyes (PME) larger than posterior

lateral eyes (PLE), both much larger than anterior eyes. Eye arrangement: anterior eye row slightly procurved, equal or subequal (less than 0.02 mm difference) to PME width. PME width less than PLE width. PME width greater than length of posterior ocular quadrangle (POQ).

Cephalothorax relatively flat when viewed from the side, tapering downward slightly in cephalic region.

Legs relatively short when compared to carapace length (ratio derived by dividing length of leg IV by carapace length 2.4 to 3.2 in females and 2.6 to 3.3 in males). Order of leg length IV-I-II-III. Order of length of segments: patella-tibia IV—metatarsus IV—patella-tibia I in *avara* group; patella-tibia IV—patella-tibia I—metatarsus IV in *terricola*. *Trochosa terricola* males have patella-tibia I longer than patella-tibia IV.

Posterior cheliceral teeth 3-3 in *avara* group, variable in *terricola* (Map 1 and Table 1).

Epigynum of female with median septum (*ms*) in shape of inverted "T" (Fig. 25). The longitudinal piece (*lp*) broad and flat in *terricola* (Fig. 13) or narrow with a bulbous white structure (*b*) filling most of the atrium in the *avara* species group (Fig. 27). In the latter species the transverse piece (*tp*) of the median septum has the ends curved anteriorad.

Palpus of male with palea (*p*) partly sclerotized (Fig. 46) or heavily sclerotized with prominent distal knob (Fig. 40). Embolus (*e*) arising on distal or prolateral margin of palea with long intromittent part curled distally into a loop (Fig. 30) or with broad pars pendula (*pp*) and a short intromittent part angled distally (Fig. 45). Conductor (*c*) prominent, broad, and concave (Fig. 42). Median apophysis (*ma*) well developed, conspicuously enlarged and directed ventrad in some species (Fig. 43).

Diagnosis. As described above, representatives of the genus *Trochosa* differ from those of other lycosid genera primarily in the distinctive color pattern of the carapace. In addition the first eye row, which is essentially equal in width to the PME row, the low carapace that slopes downward anteriorly, and the relatively short legs are features that distinguish *Trochosa* from other lycosid genera. The relative dimensions of the eye rows compared to one another, and the carapace dimensions compared to leg length are

quite similar in *Trochosa* species; and once known for all genera of North American lycosids these ratios may help to set apart *Trochosa*, as well as other genera.

Although the ecology and behavior of North American species of *Trochosa* have not been well studied, there is enough information to indicate similarities in habitats and phases of life history. All North American species of *Trochosa* inhabit edge of woods or open woodland habitats (as do a number of their Palaearctic relatives). None of the American *Trochosa* are burrowers, such as *Geolycosa* and many species of *Lycosa*. Both *Trochosa terricola* and *avara* are often found under logs or stones, where they presumably molt and construct egg cases. These ecological and behavioral features also serve to separate species of *Trochosa* from many other lycosids.

Species Groups. The structure of the male palpus and the female epigynum are often diagnostic at the generic level in spiders. In the case of *Trochosa* the genitalia delimit two species groups: *uricola*, *robusta*, *spinipalpis*, and *terricola* on the one hand; and *avara*, *gosiuta*, *shenandoa*, and *parthenus*, on the other hand. In *Trochosa terricola* the male is recognized by the long, thin embolus forming a loop at its distal end (Fig. 30) and the female by the broad inversely "T-shaped" epigynum (Figs. 13, 14, 16). *Trochosa uricola*, *robusta*, and *spinipalpis* of Europe are very similar to *terricola* in genitalic structure (see Locket and Millidge 1951, Engelhardt 1964, Fuhn and Burlacu 1971). In North America *terricola* is the lone member of the *uricola* species group and is easily differentiated from other species of *Trochosa* in this region by genitalic structure.

Trochosa avara females are recognized by the epigynum which has the ends of the transverse piece directed anteriorly (Figs. 20, 21). This feature is characteristic of females of the *avara* group (Figs. 18, 23, 25, 27) and separates them from all other North American Lycosidae. A unique feature of the males in the *avara* group is the embolus which expands into a broad flattened, semi-transparent plate as it curves beneath the palea and then narrows to form a filament that coils into the concavity of the conductor (Figs. 34, 36, 39, 42, 45). The twist at the tip is reminiscent of the embolus in *terricola*. Despite the differences in structure of the male and female genitalia of *terricola* when compared with representatives of the *avara* group, the close correspondence in color patterns, particular morphological features, and certain ecological characteristics warrant their inclusion in a single genus.

Species Excluded from *Trochosa*

The following North American species have been placed in *Trochosa* by previous authors, but they do not belong in this genus as it is diagnosed here.

Lycosa animosa Walckenaer, 1837. Placed in *Trochosa* by Simon (1864) = *Anahita animosa* (Walckenaer)

Trochosa cherokee Chamberlin and Ivie, 1942 = *Lycosa cherokee* (Chamberlin and Ivie)

Lycosa contestata Montgomery, 1903. Placed in *Trochosa* by Montgomery (1904) and synonymized by Chamberlin (1909) with *Lycosa pratensis* Emerton, 1885 = *Lycosa contestata* Montgomery

Lycosa frondicola Emerton, 1885. Placed in *Trochosa* by Montgomery (1904) = *Lycosa frondicola* Emerton

Lycosa similis Banks, 1897. Synonymized by Banks (1916b) with *Lycosa pratensis* Emerton, 1885 = *Lycosa similis* Banks

Lycosa animosa Walckenaer was transferred to the genus *Anahita* of the Family Ctenidae by Chamberlin and Ivie (1942). John Abbot's Figure 81, the figure upon which the name *Lycosa animosa* is based, in the *Spiders of Georgia* (1792) is not *Trochosa*. Chamberlin and Ivie are probably correct in their diagnosis. The female holotype of *Trochosa cherokee* Chamberlin and Ivie from the American Museum of Natural History (AMNH) was examined. It belongs to the *Lycosa gulosa* species group. The holotype of *Lycosa contestata* Montgomery from the AMNH was examined. It is an immature female belonging to the *Lycosa helluo* species group. Numerous specimens of *Lycosa frondicola* were examined, samples were measured, and detailed drawings made for comparison to species of *Trochosa*. I concluded that *frondicola* is best placed in *Lycosa* at present. The holotype of *Lycosa similis* Banks from the Museum of Comparative Zoology (MCZ) was examined. It is an immature female belonging to the *Lycosa helluo* species group. In addition to the above species, type specimens of *Lycosa abdita* Gertsch from the AMNH and *Lycosa acoma* Chamberlin from the MCZ were examined because of certain Trochosoid characters they possessed. They do not belong in *Trochosa* as it is conceived here.

METHODS

Spider systematists, in general, employ many of the same techniques and methods in their study of materials. Basically a number of measurements of bodily components are made and characters of taxonomic importance are illustrated. These measurements and drawings characterize the species under investigation and aid in their identification and separation from closely related forms. Some idea of the phylogenetic relationships of species can be gained from this information as well.

It is often taken for granted by the specialist that others outside his field know about the techniques and methods employed and the rationale behind them. Since this is not necessarily true, and since this is the first in an anticipated series of systematic revisions on the Lycosidae, I decided to explain some of the details involved in the study. The methods and rationale set forth here will be a basis for future investigations. The subheadings below include the components explored in the analysis of each species.

Discussion. Under this subheading an attempt is made to clarify the nomenclatural history of the species in question as well as explain the rationale for certain conclusions regarding names.

Figures and Color Descriptions. The color descriptions and illustrations are based on fresh alcoholic specimens in most cases. Well-preserved specimens of *Trochosa* in which the hairs have not been rubbed off are very similar to the living spiders and were utilized where possible. The differences in live and freshly preserved lycosids is produced by shrinkage in alcohol, which disrupts the abdominal color pattern; wetting, which makes the specimen darker than in life; and rubbing off of appressed hairs which make up some of the color pattern. Where discrepancies in color between live and preserved specimens have been observed, they are noted.

Color descriptions and illustrations were made under low power (16X) of a dissecting microscope, with the spider illuminated by a microscope lamp. Where variation is great, the range of color patterns representative of the greatest number of specimens is described. A given specimen may not fit the general description in all details.

For each species a dorsal view of the female was drawn, with an additional drawing of *T. terricola* to indicate the range of variation. The dorsal color pattern is one of the distinctive features of the

genus *Trochosa*. At least two drawings of the female genitalia were made for each species: a ventral external view of the epigynum after all the hair had been removed (often revealing some internal structure through the integument) and a dorsal view with the separated genitalia submerged in clove oil for clearing. The female genitalia of all species are drawn to the same scale. Two views of the male palpus were drawn for each species: a ventral view and a retrolateral view. The left palpus of the male was drawn after gentle removal of hair to reveal the palpal sclerites. All palpi are drawn to the same scale. The female genitalia and the male palpus are classically used in identifying spider species and they are of considerable importance in *Trochosa* for that purpose.

Measurements. All measurements listed are in millimeters. Two net micrometers (0.5mm, 1.0mm) were used in an ocular (16X) with a combination of low (1X) and high (4X) power objectives for making measurements. The higher power combination was used in measuring the eye rows and was determined to be accurate to 0.2 units of the micrometer grid or 0.025mm. The lower power combination was used to measure the body dimensions and leg lengths and was determined to be accurate to 0.2 units of the micrometer grid or 0.1mm. A measurement when retaken always read within two units of the original measurement with either of the micrometer grids, e.g., an original measurement of 6.5 micrometer units when retaken would read 6.3–6.7 units. In all cases the greatest dimension of the structure was recorded, e.g., patella-tibia length was measured as the greatest distance from a line tangent to the most proximal part of the patella to a line tangent to the most distal part of the tibia.

The segments of leg I were measured from the prolateral aspect, as was patella-tibia II. The segments of leg IV were measured from the retrolateral aspect, as was patella-tibia III. This method was found to be accurate and resulted in fewer broken legs than others that were tried. Total body length was estimated by measuring the abdomen and adding this figure to carapace length. Although the anterior end of the abdomen tends to overlie part of the cephalothorax, the abdomen usually shrinks in alcohol, reducing its size. Measurements of total body length in this fashion can be reproduced more accurately, and since this dimension is highly variable, its primary function is for general recognition, not definition of the species.

A set of 10 specimens of each sex was measured to give some idea of the range of variability within a species. A series of 19 different measurements was made of selected specimens of all species. Since eastern and western populations of *Trochosa terricola* differ in the number of posterior cheliceral teeth (Map 1) and in color and were described as different species, it seemed best to treat them separately for comparison. Six additional measurements of *T. terricola* epigyna, used by Locket and Millidge (1951) to separate female specimens of European *Trochosa*, were also made to compare North American populations of *terricola* with European populations. The range and mean for the more significant measurements are recorded for each species. The measurements should prove useful not only to identify certain species of North American *Trochosa*, but to help distinguish this genus from others as the study progresses. Preliminary measurements of other lycosids indicate that both the eye arrangement and ratio of leg length to carapace width or length are useful in distinguishing genera.

Diagnosis. The species under investigation is compared to its closest relative(s) and differences that distinguish them are noted.

Natural History. In discussing methods (in a broad sense) it is appropriate to emphasize the importance of routine observations in the field. It is not the province of the systematist to explore and record detailed elements of the ecology and behavior of each species he studies, nor is it practicable from the standpoint of time, but it behoves him to note the habitat where certain species are found and any peculiar behavioral traits associated with the species. This kind of information is often as valuable to the systematist as that concerning morphological features and should be incorporated into decisions about species relationships.

Distribution. The geographic range of the species is given.

Records. Includes only those specimens examined. Collecting localities for Canada are listed by city or town and separated by a semicolon. Multiple records for the United States are listed by county and separated by a semicolon. Collection records at the periphery of the species range are given in detail. The lower case "o" represents immature specimens.

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Finally a word of appreciation and recognition is given to Dr. W. J. Gertsch, Dr. H. K. Wallace, the late Dr. A. M. Chickering, and the late Mr. W. Ivie for their efforts in collecting many of the specimens examined.

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Key to Females

- 1a. Posterior margin of cheliceral fang furrow with three teeth 2
- 1b. Posterior margin of cheliceral fang furrow with two teeth *terricola*
- 2a. Longitudinal piece of median septum of epigynum narrow, with lateral ends of transverse piece directed anteriad (Figs. 8, 9, 18, 20, 21, 23, 25, 27) 3
- 2b. Longitudinal piece of median septum of epigynum broad, with transverse piece straight (Figs. 10, 13, 14, 16) *terricola*
- 3a. Longitudinal piece of median septum with blunt, posterior median process and with lateral ends of transverse piece extending only slightly anteriad (Figs. 20, 21). Eastern United States (Map 2) *avara*

- 3b. Longitudinal piece of median septum without blunt, posterior median process and with lateral ends of transverse piece extending considerably anteriorly (Figs. 8, 9, 18, 23, 25, 27) 4
- 4a. Color pattern of carapace with two dark, elongate spots or short dashes within light, broad median stripe (Figs. 3, 5, 6) 5
- 4b. Color pattern of carapace without dark spots or dashes within light, broad median stripe (Fig. 4). Western United States (Map 2) *gosiuta*
- 5a. Width of transverse piece of epigynum less than twice length of longitudinal piece (Figs. 18, 23, 25) *shenandoa*
- 5b. Width of transverse piece of epigynum more than three times length of longitudinal piece (Figs. 8, 9). Primarily restricted to peninsular Florida and adjacent regions (Map 3) *parthenus*

Key to Males

- 1a. Posterior margin of cheliceral fang furrow with three teeth 2
- 1b. Posterior margin of cheliceral fang furrow with two teeth *terricola*
- 2a. Embolus of palpus long and thin with tip curled to form characteristic loop or "pig-tail" (Figs. 28-31) ... *terricola*
- 2b. Embolus of palpus with broad flattened subterminal area and short, thinner tip forming hook but not loop (Figs. 32-37, 39, 40, 42, 43, 45, 46) 3
- 3a. Total body length 5.7-7.6 mm. Primarily restricted to peninsular Florida and adjacent regions (Map 3) ... *parthenus*
- 3b. Total body length 7.5-8.4 mm. Occurring outside peninsular Florida 4
- 4a. Palea of palpus with prominent distal knob (Figs. 34-37, 39, 40, 42, 43) and proximal pair of retrolateral macrosetae of tibia I stout and elongate (Figs. 38, 41) 5
- 4b. Palea of palpus without prominent distal knob (Figs. 45, 46) and proximal pair of retrolateral ventral macrosetae of tibia I not as stout or elongate (Fig. 44). Western United States (Map 2) *gosiuta*
- 5a. Median apophysis of palpus greatly enlarged and directed ventrad (Figs. 36, 37, 39, 40). Proximal retrolateral ventral macroseta of tibia I not extending more than one-half distance along shaft of median retrolateral macroseta (Fig. 38) ...
..... *avara*

- 5b. Median apophysis of palpus not as large (Figs. 34, 35, 42, 43). Proximal retrolateral ventral macroseta of tibia I extending more than one-half distance along shaft of median retrolateral macroseta (Fig. 41) *shenandoa*

Trochosa terricola Thorell

Figures 1, 2, 10–16, 28–31. Map. 1. Table 1.

Lycosa trabilis: C. L. Koch 1836: heft 134, pls. 19, 20; 1840: 410; 1847: 229. Not *Lycosa trabalis* Clerck according to Thorell 1856.

Trochosa trabilis: C. L. Koch 1848: 141. Not *Lycosa trabalis* Clerck according to Thorell 1856.

Lycosa agretica: Blackwall 1842: 407. Not *Lycosa agretica* Walckenaer according to Pickard-Cambridge 1874.

Trochosa terricola: Thorell 1856: 171. Syntypes (2♂♂:3♀♀) from Uppsala, Sweden, in the Natural History Museum, Stockholm, Sweden, not examined, but see below. Pickard-Cambridge 1874: 332. Bonnet 1959: 4713.

Lycosa terricola: Westring 1861: 529.

Tarentula terricola: Collett 1875: 255.

Trochosina terricola: Simon 1885: 10.

Lycosa pratensis Emerton, 1885: 483, pl. 46, figs. 4, 4a, 4b, ♀♂. Two female syntypes from Salem, Essex Co., Massachusetts, in the Museum of Comparative Zoology, examined. Emerton 1894: 422, pl. 3, fig. 4, ♀; 1902: 69, figs. 168–170, ♀; 1913: 156; 1914: 118; 1920: 328; 1921: 108; 1924: 123, 124; 1928: 46; 1930: 168. Marx 1890: 563. Banks 1892: 64; 1895: 91; 1900: 483; 1907: 57; 1910: 57; 1916a: 71; 1916b: 80. Harrington 1897: 191. Slosson 1898: 248. Britcher 1903: 191. Ruthven 1906: 101. Bryant 1908: 85. Chamberlin 1908: 225, 261, pl. 21, fig. 3, ♀. Petrunkevitch 1911: 565. Comstock 1913: 638, fig. 720a, ♀; 1940: 649, fig. 720b, ♀ Barrows 1918: 314. Holmquist 1926: 410. Crosby and Bishop 1928: 1067. Worley and Pickwell 1931: 94. Banks and Newport 1932: 31. Elliot 1932: 423. Worley 1932: 55. Procter 1933: 272. Chickering 1933: 516. Crosby and Zorsch 1935: 39. Kaston 1938: 184.

Lycosa terricola pallida Nosek, 1904: 4. First synonymized by Bonnet 1949: 4716.

Tarentula pratensis: Strand 1906: 466.

Lycosa orophila Chamberlin and Gertsch, 1929: 108. Female holotype from Montpelier, Bear Lake Co., Idaho, in the American Museum of Natural History, examined. Chamberlin and Ivie 1933: 50. First synonymy by Gertsch 1934: 1.

Alopecosa terricola: Denis 1937: 167.

Trochosa pratensis orophila: Chamberlin and Ivie 1947: 24. Hackman 1954: 78. Lindroth 1957: 104.

Trochosa pratensis: Kaston 1948: 330, figs. 1092–1094, 1117–1118, ♀♂; 1953: 147, fig. 371. Bonnet 1959: 4706.

Trochosa terricola pratensis: Hackman 1954: 78. Lindroth 1957: 104. Fox and Donale 1972: 1914.

Trochosa terricola: Dondale 1971: 67. Kaston 1972: 198, fig. 446; 1978: 188, fig. 478.

Discussion. The synonymy for European *Trochosa terricola* given here follows that of Bonnet (1959). In most cases, only the initial

usage of the various synonyms by European authors is given. For more complete synonymy of the European populations refer to Bonnet (1959: 4713-4716).

Gertsch (1934) reported that Reimoser (1919) considered *Lycosa pratensis* Emerton a synonym of *Trochosa robusta* Simon, but when Gertsch compared *L. pratensis* Emerton with European species of *Trochosa* he found that "it is more closely related to *Trochosa terricola*, of which it is scarcely more than a variety." Hackman (1954), Lindroth (1975), and Fox and Dondale (1972) regarded *pratensis* as a subspecies of *terricola*. Dondale (1971) was the first American to use *Trochosa terricola* Thorell for the species that has long been known under the name of *T. pratensis* (Emerton) and Kaston (1972, 1978) followed suit.

To clarify the matter I requested the holotype of *T. terricola* from the Swedish Museum of Natural History, Stockholm, for comparison with *T. pratensis*. Mr. T. Kronestedt informed me that Thorell had not designated any type, but he did list (Thorell 1856: 171) *terricola* among species found in the Swedish province of Uppland. Kronestedt reported: "There is in our museum a collection of dry pinned spiders belonging to Thorell. In this collection are preserved other species which Thorell described as *new* in the above publication, so the original *terricola* specimens should be there too, and there are three males and four females. Two males and three females bear the label 'Ups.', which means Uppsala in the province of Uppland. The three dry males in the collection are all *terricola* in the present sense. They have the terminal loop in the embolus, characteristic of this species and also present in *pratensis*." Kronestedt felt it would be risky to send pinned specimens through the mails and I agreed. Instead he sent three males and one female from the type locality in preservative for examination. In addition a male, which survived the transatlantic crossing in the mails, arrived alive and was observed for one week before preserving. These specimens together with 33 other European specimens of *terricola* that I've examined agree in most details with *pratensis* and I cannot distinguish them. The males and females in the Swedish Museum of Natural History bearing the "Uppsala" label are considered syntypes.

Chamberlin and Gertsch (1929) described *Lycosa orophila* from Idaho and Utah as new. They reported that, "This species is indistinguishable from *Lycosa pratensis* Emerton except in the fact that the

lower margin of the chelicerae is armed with two rather than three teeth." Gertsch (1934) listed *L. orophila* as a junior synonym of *L. pratensis* and reported upon the geographic distribution of the number of teeth on the lower cheliceral margin. Chamberlin and Ivie (1947) later compromised by relegating *orophila* to subspecies status, presumably because of the difference in number of teeth on the posterior cheliceral margin. The geographic distribution of the character in over 1300 specimens is shown by Map 1 and Table 1. Since a single symbol on the Map 1 may indicate from one to 50 specimens a more accurate distribution of actual numbers is given by province and state in Table 1. From these data it is clear that subspecies of *T. terricola* in North America cannot be delineated by the number of posterior cheliceral teeth present in certain populations. Measurements of selected specimens from the eastern and western United States indicate a slightly larger average size for those in the East. However, there is considerable overlap in size and none of the other anatomical characters measured allows separation of these populations into subspecies (compare *Measurements* of eastern and western populations). It is possible that biochemical, ecological or behavioral studies may help clarify the relationships of the populations of *T. terricola* in Europe and the eastern and western United States. Until more information is forthcoming, I find it difficult to recognize subspecies of *T. terricola*.

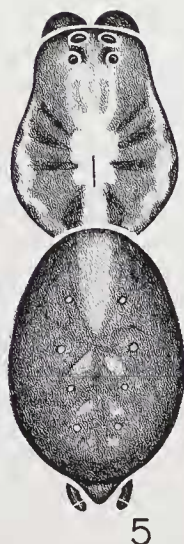
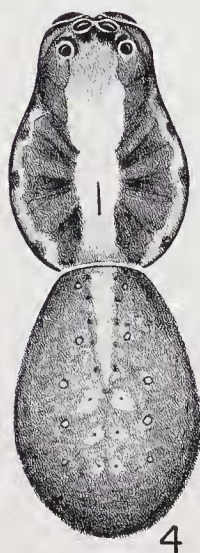
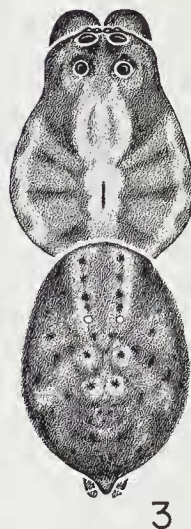
Color. Eastern Females. Face dark orange-brown. Chelicerae darker, reddish brown. Condyles orange-brown. Eyes with black nacelles.

Carapace dark orange-brown with broad median stripe of pale yellow-orange; with paired short stripes of a darker color inside median stripe as in Figure 1, and with yellow-orange submarginal stripes.

Dorsum of abdomen brown in appearance, with yellow-orange base mottled with dark brown forming pattern as in Figure 1. Venter of abdomen yellow to pale yellow-orange, with darker mottling along sides.

Legs yellow to pale yellow-orange; with few dusky markings dorsally, but without distinct bands. Distal region of tibiae, metatarsi, and tarsi brown.

Labium and endites orange-brown with distal ends paler, yellowish. Sternum light orange-brown.



I 1mm



Color. Western Females. Face yellow to brownish yellow, lightest along lower edge of clypeus. Chelicerae darker, orange to brownish orange. Condyles lighter, yellow. Eye nacelles black.

Carapace yellow-brown with broad, yellowish median stripe enclosing pair of darker short stripes anteriorly as in Figure 2; with pale yellowish submarginal stripes.

Dorsum of abdomen pale yellow to brownish yellow with irregular spots of dark gray or brown as in Figure 2. Cardiac area even colored, pale brownish yellow to tan. Venter of abdomen cream to pale brownish yellow, without darker markings.

Legs yellow to pale brownish yellow, without darker markings, lighter ventrally.

Labium and endites yellowish brown to orange-brown; with distal ends cream to pale yellow. Sternum yellow to light brownish yellow.

Color. Eastern Males. Face dark orange-brown to brownish yellow at lower edge. Chelicerae dark reddish brown. Cymbium of palpus orange-brown.

Carapace dark orange-brown with broad yellow-orange median stripe, and with paired short dusky median stripes as in female. Yellow-orange submarginal stripes not as distinct as in female.

Dorsum of abdomen appearing gray-brown—color produced by background of brownish yellow finely reticulated with gray. Cardiac area pale yellowish brown. Venter of abdomen yellow to brownish yellow; sides mottled gray.

Legs with femora yellow, darker brown distally, with patella-tibiae, metatarsi, and tarsi brown.

Labium and endites brownish orange with distal ends yellowish.

Figs. 1-2. *Trochosa terricola* Thorell. 1. Female from Ridgefield, Fairfield Co., Connecticut, 9 May 1965. 2. Female from Fruitland, Payette Co., Idaho, 10-25 Sept. 1943.

Fig. 3. *Trochosa avara* Keyserling, female from Ramsey, Bergen Co., New Jersey, 24 Sept. 1934.

Fig. 4. *Trochosa gosiuta* (Chamberlin), female from Timpanogos Park, American Fork Canyon, Salt Lake Co., Utah, 13 June 1941.

Fig. 5. *Trochosa shenandoa* Chamberlin and Ivie, female holotype from Shenandoah National Park, Virginia, 5 July 1933.

Fig. 6. *Trochosa parthenus* (Chamberlin), female from Alachua Co., Florida, 8 Feb. 1934.

Sternum yellow to light brownish yellow.

Color. Western Males. Face yellow to brownish yellow, lightest along lower edge of clypeus. Chelicerae orange to brownish orange. Eye nacelles black. Cymbium of palpus brownish yellow to light brown.

Carapace yellow-brown, with broad pale yellow median stripe enclosing pair of darker stripes in the cephalic region; with lighter pale yellow submarginal stripes.

Dorsum of abdomen pale yellow to light yellow-brown with darker brown or black spots that sometimes coalesce to form pattern. Cardiac area uniformly brown with slight reddish tinge. Venter pale brownish yellow to cream without darker markings.

Legs light brownish yellow to yellow dorsally, pale yellow to cream ventrally. Distal segments darker.

Labium and endites yellow-brown with distal ends yellow to cream. Sternum yellow.

Measurements. Ten females and ten males from New Hampshire, Vermont, Connecticut, and Massachusetts representing eastern populations formerly known as *Trochosa pratensis* (Emerton).

Females					
(Eastern):	Mean	Range		Mean	Range
Ant. Eye Row	.919	.86- .98	Femur I	3.02	2.8- 3.4
PME	.925	.88- .98	Pat.-Tibia I	3.88	3.5- 4.3
PLE	1.289	1.19- 1.38	Meta. I	2.06	1.8- 2.3
POQ	.822	.79- .88	Tarsus I	1.29	1.2- 1.4
			Total I	10.18	9.2-11.4
Carapace					
Width	3.56	3.2 - 3.9	Femur IV	3.42	3.0- 3.8
Carapace					
Length	4.89	4.5 - 5.4	Pat.-Tibia IV	4.12	3.8- 4.4
Body Length	10.36	9.2 -11.2	Meta. IV	3.51	3.2- 3.8
Pat.-Tibia II	3.41	3.0 - 3.8	Tarsus IV	1.47	1.4- 1.6
Pat.-Tibia III	3.00	2.8 - 3.3	Total IV	12.48	11.4-13.3

Males					
(Eastern):	Mean	Range		Mean	Range
Ant. Eye Row	.818	.71- .88	Femur I	3.12	2.8- 4.0
PME	.830	.74- .89	Pat.-Tibia I	4.15	3.7- 4.6
PLE	1.122	.90- 1.25	Meta. I	2.67	2.4- 3.1
POQ	.744	.64- .88	Tarsus I	1.56	1.4- 1.8
			Total I	11.40	10.0-13.4

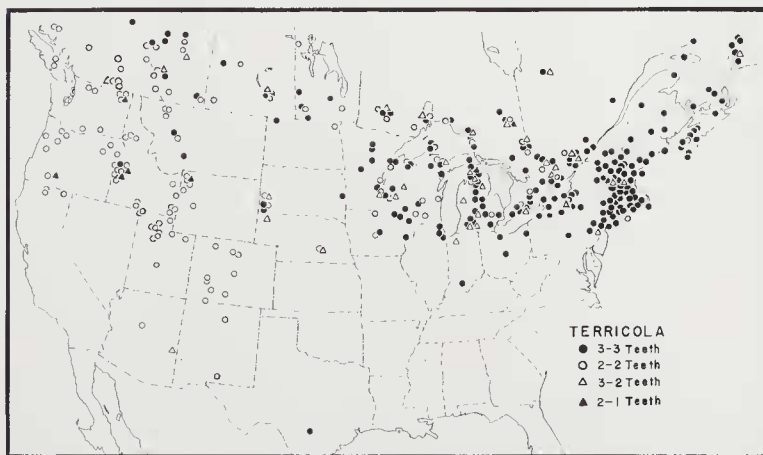
Carapace					
Width	3.24	2.8 - 3.6	Femur IV	3.30	2.9- 3.8
Carapace					
Length	4.44	3.8 - 4.9	Pat.-Tibia IV	3.94	3.5- 4.4
Body Length	8.55	7.2 - 9.6	Meta. IV	3.54	3.2- 3.9
Pat.-Tibia II	3.44	3.0 - 3.8	Tarsus IV	1.48	1.4- 1.6
Pat.-Tibia III	2.94	2.6 - 3.4	Total IV	12.27	10.9-13.6

Measurements. Ten females and ten males from Fruitland, Payette Co., Idaho, 14 Sept. 1943, representing western populations formerly known as *Lycosa orophila* Chamberlin and Gertsch.

Females					
(Western):	Mean	Range		Mean	Range
Ant. Eye Row	.835	.74- .95	Femur I	2.74	2.4- 3.3
PME	.829	.75- .95	Pat.-Tibia I	3.39	3.0- 4.2
PLE	1.121	1.02- 1.29	Meta. I	1.86	1.5- 2.2
POQ	.731	.66- .80	tarsus I	1.17	1.0- 1.4
			Total I	9.20	7.9-11.0
Carapace					
Width	3.20	2.8 - 3.8	Femur IV	3.14	2.8- 3.6
Carapace					
Length	4.40	3.8 - 5.2	Pat.-Tibia IV	3.65	3.2- 4.3
Body Length	9.34	8.2 -11.8	Meta. IV	3.08	2.7- 3.6
Pat.-Tibia II	3.02	2.5 - 3.7	Tarsus IV	1.39	1.1- 1.7
Pat.-Tibia III	2.70	2.4 - 3.2	Total IV	11.30	9.8-13.0

Males					
(Western):	Mean	Range		Mean	Range
Ant. Eye Row	.725	.66- .78	Femur I	2.63	2.4- 2.9
PME	.732	.69- .78	Pat.-Tibia I	3.52	3.2- 4.0
PLE	.969	.88- 1.09	Meta. I	2.24	2.0- 2.6
POQ	.649	.60- .71	Tarsus I	1.38	1.2- 1.4
			Total I	9.76	8.8-10.8
Carapace					
Width	2.82	2.6 - 3.2	Femur IV	2.88	2.6- 3.2
Carapace					
Length	3.84	3.4 - 4.4	Pat.-Tibia IV	3.43	3.2- 3.9
Body Length	7.74	6.7 - 9.4	Meta. IV	2.98	2.8- 3.4
Pat.-Tibia II	2.90	2.6 - 3.2	Tarsus IV	1.34	1.2- 1.5
Pat.-Tibia III	2.52	2.3 - 2.8	Total IV	10.64	9.9-11.7

Diagnosis. *Trochosa terricola* is like other Nearctic species of *Trochosa* in color pattern (compare Figs. 1, 2 with 3-6) and morphological features such as the eye arrangement and relative length of legs compared to carapace length. Males of *terricola* differ from other Nearctic species of *Trochosa* in structure of the palpus (compare Figs. 28-31 with Figs. 32-37, 39, 40, 42, 43, 45, 46). The most distinguishing feature of the palpus in *terricola* is the loop at the distal end of the embolus (Fig. 30). Females of *terricola* differ from other Nearctic species of *Trochosa* in structure of the epigynum. The transverse piece of the epigynum in *terricola* does not have the ends curved anteriad as in *avara*, *gosiuta*, *shenandoa*, and *parthenus* (compare Figs. 10-16 with Figs. 7-9, 17-27). *Trochosa terricola* forms together with *spinipalpis*, *robusta*, and *ruvicola* of Europe a close-knit species group. There is a great anatomical similarity among these species and a definitive study of the middle European species of *Trochosa* (Engelhardt 1964) did not reveal any ecological, seasonal, or ethological isolation mechanisms present. These four species occur sympatrically throughout western and central Europe. In spite of morphological, ecological, and behavioral similarities, no hybrids could be produced in the laboratory. Engelhardt suggests that physiological mechanisms (pheromones) may prevent hybridization between these species.



Map 1. Collection localities for *Trochosa terricola* showing distribution of posterior cheliceral teeth. Alaskan and northern Canadian localities not on map are listed under *Records* and marked with asterisks.

Table I
Posterior Cheliceral Teeth—*Trochosa terricola**

State or Province	3-3	3-2	2-2	2-1
Alaska			15	
Newfoundland	8	1		
Prince Edward Island	1			
Nova Scotia	102	1	1	
New Brunswick	22			
Quebec	39	3	1	
Ontario	147	19	97	1
Manitoba	5		7	1
Saskatchewan	1	1	4	
Alberta	8	6	35	
British Columbia	1	1	62	
Maine	19			
New Hampshire	28	1		
Vermont	28	1		
Massachusetts	68			
Rhode Island	1			
Connecticut	22	1		
New York	56	1	2	
New Jersey	18	1		
Pennsylvania	5			
Ohio	5			
Michigan	43	8	9	1
Indiana	2	1		
Wisconsin	10	2	7	
Illinois	4			
Minnesota	16	1	9	
Iowa	8		3	
North Dakota	1		1	
South Dakota	5	1	2	
Texas	1			
Montana	2			
Idaho	1		192	2
Wyoming			33	1
Colorado			9	
Utah			33	
New Mexico			3	
Arizona		1	1	
Washington			65	1
Oregon			14	1
California			12	
TOTALS	677	51	617	8

*Geographic distribution of *Trochosa terricola* with reference to number of posterior cheliceral teeth. Geographical sequence is from North to South and East to West.

Of the above three species *terricola* appears to be most closely related to *spinipalpis*. Males of *spinipalpis* can be identified by macrosetae on the ventral side of the palpal tibia. These macrosetae are absent in *terricola*. According to Locket and Milledge (1951) the females of the two species can be separated by color and certain anatomical proportions. For example, the number derived by dividing the width of the transverse piece of the epigynum by the width of the sternum between coxae II ranges from .30-.33 in *terricola* and .24-.29 in *spinipalpis*. In addition European specimens of *terricola* (93%) have 2-2 posterior cheliceral teeth while *spinipalpis* (66%) tend to have 3-3 posterior cheliceral teeth. For a thorough analysis of comparative anatomy of the Middle European *Trochosa* see Engelhardt (1964).

In North America *Trochosa terricola* shows considerable variation in the number of cheliceral teeth and in color. In general, eastern populations tend to be darker in color and tend to have 3-3 posterior cheliceral teeth and western populations tend to be lighter in color and have 2-2 posterior teeth. The geographic pattern of the number of posterior cheliceral teeth in specimens examined is shown in Map 1 and Table 1. Because a single symbol on this map may represent anywhere from one to 50 specimens it tends to exaggerate the variability of this character. Table 1 is a list of the actual number of specimens examined from each locality. These data indicate that populations of *Trochosa terricola* in North America cannot be separated into distinct geographic races upon the basis of cheliceral teeth number. It remains to be seen whether or not additional information concerning the ecology, behavior, or genetic mechanisms of the eastern and western populations will support recognition of subspecies.

Natural History. Kaston (1948) reports this species running over dead leaves of forest floors, and beneath stones in fields. I have found this species in Michigan under logs and in leaf litter of deciduous woods. It occurs most often at the edge of woods. Males have been captured in pitfall traps in an old field.

According to Engelhardt (1964) Central European populations of *terricola* have spring and fall mating seasons. Males may live up to two years and females longer, with those of the autumn generation surviving almost three years. The habitat of *terricola* in Europe resembles closely that of American populations. The skirts of forests

where medium humidity and little shadow prevail offer preferred situations.

The comparative study of Central European *Trochosa* by Engelhardt (1964), covering the morphological, ethological, and autecological characteristics of *robusta*, *ruricola*, *spinipalpis*, and *terricola*, provides a wealth of detailed information.

Distribution. Temperate areas of the Holarctic Region (Map 1).

Records. *ALASKA. Haines, 20–25 Aug. 1945, ♂ (J. C. Chamberlin); Ketchikan, 29 Aug. 1922, ♀ (R. Marshall); Kodiak, 22–25 Aug. 1958, 3♀♀ (C. Lindroth); Matanuska, 26 May 1944, 3♀♀; 23 May 1945, ♂♀ (J. C. Chamberlin); Palmer, 31 Aug. 1959, ♀ (A. B. Krom); Wasella, 11 Oct. 1959, ♂♀ (A. B. Krom); Wrangell, 1–20 Sept. 1951, ♂ (B. Malkin).

CANADA. *Northwest Territory. Mackenzie Dist.: 40 mi. NW of Enterprise, 15 Aug. 1965, ♀ (J., W. Ivie). *Labrador. Natashquan River, 1912, ♀ (T. W. Townsend). Newfoundland. Bay of Islands, Aug. 1912, ♀ (Lung); 4 July 1927, ♀ (O. L. Austin); Deer Lake, 19 June 1915, ♀ (G. K. Noble); Humber River, Sept. 1912, ♀ (G. C. Shattuck); *St. John's, 20 May 1958, ♂, 31 Aug., ♀; Spruce Brook, Aug. 1912, ♂♀♀ (Lenz); Bay St. George, Stephenville Crossing, July 1912, ♀♀ (Engelhart). Prince Edward Island. Malpeque Bay. Nova Scotia. Barrington; Beaconsfield; Bridgewater; Canard; Cape Breton Island; Digby; Gasperaux; Glenora Falls; Granville Ferry; Graywood; Kentville; Sable Island. New Brunswick. Fredericton; Green River, N of Edmundston; Priceville. Quebec. Anticosti Island; Bagotville; Breckenridge; Entry Island; Fort Coulonge; Freightsburg; Kingsmere; Gatineau Park; Montreal; Mt Orford; Natashquan; St. Agathe; Sherbrooke; Vaudreuil. Ontario. Algonquin Provincial Park; Ameliasburgh; Ancaster; Batchawana; Bear Island, Lake Temagami; 9 mi. N of Bloomfield; Brion Island; Chatterton; Cochrane; 30 mi. E of Dryden; 20 mi. E of Dryden; 2 mi. N of Dryden; Fitzroy; Grundy Lake Provincial Park; Ingersoll; 70 mi. E of Kenora; 20 mi. E of Kenora; Lake Superior Provincial Park; Lake Temagami; 15 mi. W of Marathon; Maynooth; Mazinaw Lake; Mer Bleue, near Ottawa; New Liskeard; 17 mi. W of Nipigon; Odessa; Ottawa; 10 mi. NW of Ouimet; Oxford Mills; 3 mi. S of Porquis Junction; Port Credit; Raith; 3 mi. N of Ramore; Rednersville; Ridgetown; St. Thomas; 7 mi. E of Smooth Rock Falls; 19 mi.

*Not on Map 1.

S of Temagami; 7 mi. S of Temagami; Tillsonburg; Toronto; Trout Creek, Parry Sound District; Turkey Point; Wallacetown; Walsingham; Warsaw; Wawa. *Manitoba*. Birtti; 15 mi. S of Deloraine; 2 mi. E of Pipestone; Rocky Lake; Winnipeg. *Saskatchewan*. Ketepwa; McLean; Montmartre; Saskatoon; Sinaluta; Skull Creek, 6 mi. E of Piapot; Waseca. *Alberta*. Athabaska River at Rocky River; 5 mi. W of Banff; Canmore; Edmonton; Fawcett; Fort McLeod; *Fort McMurray; Jasper Park; Medicine Hat; Morley; 15 mi. E of Robb; Seba; Sturgeon River, 15 mi. N of Edmonton; 9 mi. NW of Whitecourt. *British Columbia*. Comox; Crows Nest Lake; 20 mi. W of Golden; 7 mi. NE of Greenwood; *Lake Aleza; Lillooet; Penticton; Pine Pass; Port Alberni; Summerland; Terrace; Vernon; Yoho National Park.

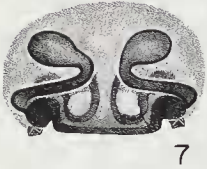
UNITED STATES. *Maine*. Cumberland; Franklin; Hancock; Knox; Lincoln; Mount Desert Island; Oxford; Piscataquis; York; Washington. *New Hampshire*. Carroll; Cheshire; Coos; Grafton; Hillsborough; Stratford. *Vermont*. Bennington; Lamoille; Rutland; Windham; Windsor. *Massachusetts*. Barnstable; Berkshire; Essex; Franklin; Hampshire; Middlesex; Nantucket; Norfolk; Plymouth. *Rhode Island*. Providence. *Connecticut*. Fairfield; Hartford; Litchfield; New Haven; Tolland. *New York*. Bronx; Cattaraugus; Cayuga; Chautauqua; Clinton; Columbia; Essex; Greene; Hamilton; Monroe; Niagara; Onondaga; Orange; Steuben; Suffolk; Tompkins; Ulster; Warren; Wayne; Wyoming. *New Jersey*. Bergen; Hunterdon. *Pennsylvania*. Carbon; Northampton; Pike. *Ohio*. Erie; Franklin;

Figs. 7-9. *Trochosa parthenus* (Chamberlin). 7-8. Female from Alachua Co., Florida, 8 Feb. 1934. 7. Spermathecae. 8. Epigynum. 9. Epigynum of female holotype from Bartow, Polk Co., Florida.

Figs. 10-16. *Trochosa terricola* Thorell. 10-12. Females from Fruitland, Payette Co., Idaho, 10-25 Sept. 1943. 10. Epigynum. 11-12. Spermathecae. 13. Epigynum of holotype of *Lycosa orophila* Chamberlin and Gertsch (= *Trochosa terricola* Thorell) from Montpelier, Bear Lake Co., Idaho, 4 July 1928. 14. Epigynum of syntype of *Lycosa pratensis* Emerton (= *Trochosa terricola* Thorell) from Salem, Essex Co., Massachusetts, May 1878. 15-16. Female from Ridgefield, Fairfield Co., Connecticut. 15. Spermathecae. 16. Epigynum.

Figs. 17-18. *Trochosa shenandoa* Chamberlin and Ivie, female from Cove Creek, Washington Co., Arkansas, Feb. 1956. 17. Spermathecae. 18. Epigynum. *lp*, longitudinal piece of median septum.

*Not on Map 1.



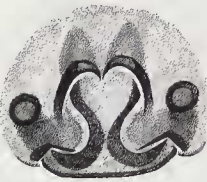
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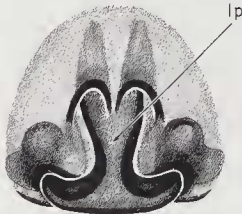
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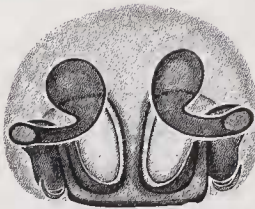
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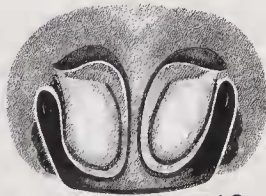
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Knox; Trumbull. *Michigan*. Berry; Calhoun; Cheboygan; Chippewa; Clare; Clinton; Crawford; Emmet; Grateot; Ingham; Iron; Keweenaw; Livingston; Mackinac; Macomb; Marquette; Menominee; Midland; Osceola; Oscoda; Otsego; Roscommon; Saginaw; Washtenaw. *Indiana*. Lawrence Co.: Mitchell, ♀♀ (N. Banks); Starke Co.: Bass Lake, ♀ (N. Banks). *Wisconsin*. Adams; Ashland; Buffalo; Chippewa; Dane; Douglas; Eau Claire; Grant; Iron; Juneau; Manitowoc; Sauk; Vernon. *Illinois*. Cook; DuPage; Lake. *Minnesota*. Anoka; Crow Wing; Goodhue; Hennepin; Itasca; Ramsey; Todd. *Iowa*. Boone; Clayton; Clinton; Story; Winnebago; Winneschick. *North Dakota*. Divide; Pembina. *South Dakota*. Brookings; Custer; Lawrence. *Nebraska*. Dawes Co.: Shadron St. Pk., 10 Aug. 1960, ♂ (H. S. Fitch); Hall Co.: 10 mi. W of Grand Island, 6 June 1933, ♀♀ (W. Ivie); Grand Island, 20 June 1910, ♀ (R. V. Chamberlin). *Texas*. Travis Co.: Austin, ♀ (R. V. Chamberlin). *Montana*. Flathead; Gallatin; Lewis and Clark; Powell. *Idaho*. Bannock; Bear Lake; Bonneville; Canyon; Idaho; Lewis; Madison; Nez Pearce; Payette; Twin Falls; Valley. *Wyoming*. Sublette; Teton; Yellowstone Nat. Pk. *Colorado*. Archuleta; Boulder; Gunnison; Hinsdale; Larimer; Rio Grande; Routt; Teller. *Utah*. Box Elder; Daggett; Rich; Salt Lake; Sevier; Summit; Utah. *New Mexico*. Otero Co.: Camp Mary White, 9-12 Aug. 1935, ♂♀oo (S. Mulaik); Taos Co.: Beulah, ♀ (R. V. Chamberlin). *Arizona*. Apache Co.; McNary, 8 July 1940, ♀o (W. J. Gertsch); Coconino Co.: Flagstaff, May 1940, ♀ (Peterson). *Washington*. Benton; Klickitat; Okanogan; Stevens. *Oregon*. Baker; Benton; Klamath; Lake; Lane; Multnomah; Wallowa. *California*. Modoc Co.: Goose Lake, ♂♀ (Holleman); Siskiyou Co.: Bray, 9 Aug. 1935, ♂:6♀♀ (R. V. Chamberlin, W. Ivie); Weed, 8 Sept. 1935, ♂♀♀ (R. V. Chamberlin, W. Ivie).

Trochosa avara Keyserling
Figures 3, 19-21, 36-40. Map 2.

Trochosa avara Keyserling, 1877: 661, pl. 8, figs. 38-39, ♂♀. Syntypes (♂♀) from "North America," L. Koch collection, deposited in the British Museum (Natural History), examined. Marx 1890: 564. Fox 1892: 269. Montgomery 1904: 304, pl. 20, fig. 42, ♀.

Lycosa rufiventris Banks, 1892: 65, pl. 3, fig. 35, ♀. Three female syntypes from Fall Creek, Cayuga Lake, Tompkins Co., New York, in the Museum of Comparative Zoology, examined. Britcher 1903: 128. Scheffer 1906: 126. First synonymized by Banks 1910: 55.

Lycosa avara: Banks 1892: 66; 1907: 743; 1910: 55; 1916b: 81. Chamberlin 1908: 279, pl. 20, figs. 1-3, ♂♀. Bryant 1908: 80. Emerton 1909: 202, pl. 7, figs. 2-2a, ♀. Petrunkevitch 1911: 556. Comstock 1912: 640, fig. 720a, ♀; 1940: 650, fig. 720a, ♀. Barrows 1918: 313. Bishop and Crosby 1926: 410. Crosby and Bishop 1928: 1066. Worley and Pickwell 1931: 91. Elliott 1932: 422. Chickering 1935: 584. Kaston 1938: 183; 1948: 329, pls. 56, 57, figs. 1091, 1114-1116, ♀♂. Bonnet 1957: 2603.
Trochosa (Varacosa) avara: Chamberlin and Ivie 1942: 37; 1944: 155.
Varacosa avara: Roewer 1954: 306.

Discussion. Keyserling (1877) apparently recognized the resemblance in the color pattern and anatomy of *T. avara* to European species of *Trochosa*. Although most American authors have maintained *avara* in *Lycosa*, it is generally agreed that this species together with the closely related *gosiuta*, *shenandoa*, and *parthenus* are close taxonomically to *Trochosa terricola*.

Chamberlin and Ivie (1942) placed *avara* in *Trochosa* and made it the type species of their new subgenus *Varacosa*. Roewer (1954) raised *Varacosa* to genetic status. *Trochosa avara* resembles *terricola* in bodily dimensions, coloration, and habitat preference, and I see no good reason for separating it as a genus or subgenus at this stage.

Color. Females. Face pale brownish yellow, lighter along lower edge of clypeus. Chelicerae darker, orange to orange-brown. Eye nacelles black.

Carapace brownish yellow to yellow-brown with broad, lighter yellowish median stripe as in Figure 3; with only faint indications of short, darker stripes within median light stripe; with indistinct lighter yellowish submarginal stripes.

Dorsum of abdomen brownish yellow to pale brown, mottled with darker gray to black spots forming an indistinct pattern as in Figure 3. Cardiac area more evenly colored yellow-brown or tan. Venter of abdomen pale yellow to cream with a few scattered darker spots, mostly along edges.

Legs yellow to pale brownish yellow without darker markings.

Labium and endites brownish yellow, with light ivory colored distal ends. Sternum pale yellow.

Color. Males. Face pale orange-brown. Chelicerae orange-brown. Cymbium of palpus orange-brown, distal tip yellowish.

Carapace orange-brown with broad median yellowish stripe. Faint dusky dashes within median stripe. Narrow, irregular yellowish submarginal stripes.

Dorsum of abdomen with yellow ground color, suffused with brown and spotted with black. Cardiac area solid brown.

Legs pale yellow to light brown, darker above.

Labium and endites yellow with distal ends cream. Sternum yellow.

Measurements. Ten females and ten males from Ramsey, Bergen Co., New Jersey.

Females:	Mean	Range		Mean	Range
Ant. Eye Row	.809	.76- .84	Femur I	2.90	2.8- 3.0
PME	.932	.88- .98	Pat.-Tibia I	3.59	3.4- 3.9
PLE	1.234	1.16- 1.32	Meta. I	1.98	1.9- 2.1
POQ	.840	.79- .88	Tarsus I	1.30	1.2- 1.4
			Total I	9.77	9.3-10.4
Carapace					
Width	3.22	3.0 - 3.4	Femur IV	3.46	3.2- 3.7
Carapace					
Length	4.43	4.1 - 4.8	Pat.-Tibia IV	4.00	3.8- 4.2
Body Length	9.22	8.6 - 9.8	Meta. IV	3.59	3.4- 4.8
Pat.-Tibia II	3.26	3.0 - 3.4	Tarsus IV	1.59	1.5- 1.7
Pat.-Tibia III	2.86	2.8 - 3.0	Total IV	12.64	12.0-13.4
<hr/>					
Males:	Mean	Range		Mean	Range
Ant. Eye Row	.742	.70- .80	Femur I	3.06	2.8- 3.3
PME	.888	.82- .92	Pat.-Tibia I	3.88	3.6- 4.2
PLE	1.168	1.05- 1.24	Meta. I	2.46	2.2- 2.6
POQ	.812	.74- .88	Tarsus I	1.40	1.2- 1.5
			Total I	10.82	10.0-11.5
Carapace					
Width	3.24	2.8 - 3.5	Femur IV	3.60	3.4- 3.9
Carapace					
Length	4.35	3.9 - 4.6	Pat.-Tibia IV	4.20	3.9- 4.4
Body Length	8.44	7.8 - 9.0	Meta. IV	4.02	3.6- 4.4
Pat.-Tibia II	3.44	3.2 - 3.6	Tarsus IV	1.78	1.6- 1.9
Pat.-Tibia III	3.03	2.8 - 3.3	Total IV	13.60	12.8-14.6

Diagnosis. *Trochosa avara* is closest to *gosiuta* in size and coloration. It also resembles that species in the structure of the epigynum. *Trochosa avara* is usually darker than *gosiuta* and the two short dark stripes enclosed within the broad median light stripe are usu-

ally discernible in *avara*, but not in *gosiuta* (compare Fig. 3 with Fig. 4). The median apophysis of the male palpus in *avara* is far more robust than in *gosiuta* (compare Figs. 39, 40 with Figs. 45, 46). Females of *avara* usually have a blunt process at the posterior end of the longitudinal piece of the median septum and the lateral ends of the transverse arms of the median septum of *avara* are not directed as far anteriad as in *gosiuta* (compare Figs. 20, 21 with Fig. 27).

The male palpal organ of *avara* is closest to that of *shenandoa* (compare Figs. 36, 37 with Figs. 34, 35). The males of these two species are best distinguished by the robust ventral macrosetae on tibia I in *shenandoa*, which are much longer than in *avara* (compare Fig. 41 with Fig. 38).

Natural History. Kaston (1948) reports collecting this species from beneath stones and along the edges of wooded areas. In New England mature females were taken from mid-March to mid-November, males from September to mid-November. The species apparently overwinters in the adult and penultimate stages. Females with egg sacs were found in June by Kaston. One egg sac measured 4mm in diameter, another 4.5mm. The first egg case contained 32 eggs, the second 78 eggs. Eggs from the second case ranged from 1.12–1.28mm in size.

Distribution. From southern Quebec and Maine in the northeast to eastern Nebraska, Kansas, and Texas in the southwest (Map 2).

Records. CANADA. *Quebec.* Lanoraie, 16 June 1915, ♂ (J. I. Beaulne). *Ontario.* Essex Co.: Windsor, 28 April 1976, ♀ (C. D. Dondale, J. H. Redner). Pelee Island, Lake Erie, 4–16 June 1950, ♀ (W. Ivie, T. B. Kurata).

UNITED STATES. *Maine.* Cumberland Co.: Long Island, 11 Sept. 1904, ♀ (E. B. Bryant). *New Hampshire.* Belknap Co.: Gilmanton, June 1925, ♀ (J. H. Emerton). *Massachusetts.* Middlesex; Norfolk. *Rhode Island.* Providence. *Connecticut.* Fairfield; New Haven; Tolland. *New York.* Nassau; Orange; Oswego; Richmond; Rockland; Suffolk; Tompkins; Westchester. *New Jersey.* Bergen; Burlington; Cape May; Hunterdon; Mercer; Ocean; Passaic. *Pennsylvania.* Bucks; Erie; Washington. *Ohio.* Athens; Champaign; Cuyahoga; Hocking; Trumbull. *District of Columbia.* Washington. *West Virginia.* Monogahela; Pocahontas. *Virginia.* Fairfax; Falls Church (Indep. City); Nansemond; Virginia Beach (Indep. City). *Tennessee.* Hamilton; Lake; Obion; Sevier. *North Carolina.* Alamance; Durham; New Hanover; Orange; Polk. *South Carolina.* Aiken; Cal-



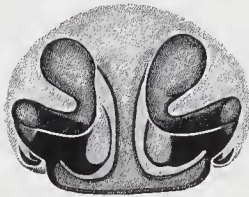
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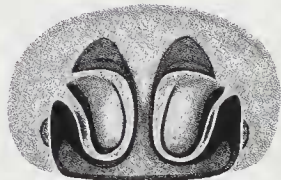
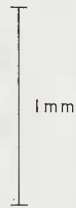
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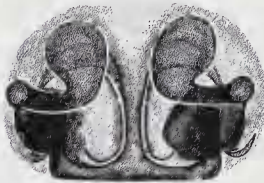
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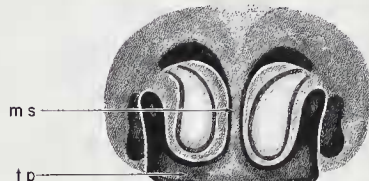
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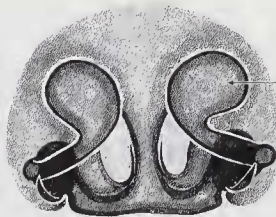
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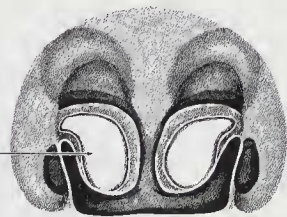
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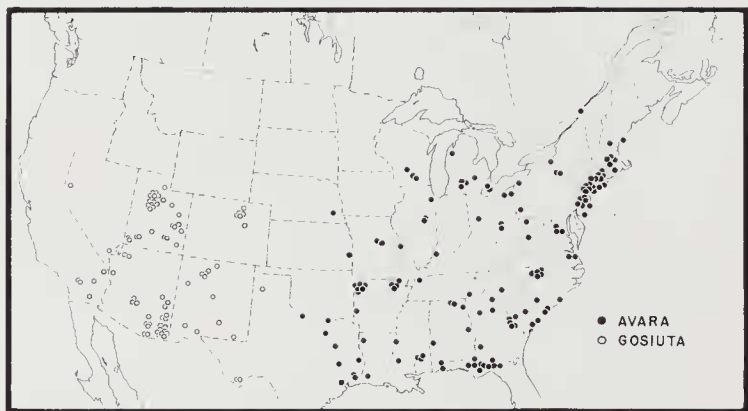
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s



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b



Map 2. Collection localities for *Trochosa avara* and *T. gosiuta*.

houn; Charleston; Darlington; Horry. *Georgia*. Clarke; Fulton; Holsersham; Rabun; Randolph; Screven; Thomas. *Florida*. Calhoun; Gadsden; Jackson; Jefferson; Leon; Liberty; Madison; Washington. *Alabama*. Baldwin; Choctaw; DeKalb; Lee; Madison. *Mississippi*. Amite; Forest; Wilkinson. *Louisiana*. Caddo. *Wisconsin*. Madison; Sauk. *Illinois*. Champaign; Cook. *Missouri*. Boone; St. Louis. *Arkansas*. Lawrence; Polk; Washington. *Nebraska*. Lancaster Co.: Lincoln, 1941, ♂ (M. J. Harbough). *Kansas*. Bourbon Co.: Redfield, 9 Oct. 1965, ♀ (J. W. Ivie). *Texas*. Anderson Co.: 19 Oct. 1951, 12 ♂♂:19 ♀♀ (K. Strawn). Dallas Co.: Dallas, 10 June 1935, ♂. Grayson Co.: Sherman, Dec. 1964, 4 ♀♀ (K. W. Haller). Hardin Co.: John Kirby St. Forest, 22 Nov. 1958, ♀♀ (A. R. Brady), Saratoga, 5 Dec. 1959, ♂ (J. C. Bequaert). Harris Co.: Seabrook, 1 Nov.

Figs. 19–21. *Trochosa avara* Keyserling. 19–20. Female from Ramsey, Bergen Co., New Jersey, 24 Sept. 1934. 19. Spermathecae. 20. Epigynum. 21. Epigynum of syntype of *Trochosa avara* Keyserling, North America.

Figs. 22–25. *Trochosa shenandoa* Chamberlin and Ivie. 22–23. Holotype from Shenandoah National Park, Virginia, 5 July 1933. 22. Spermathecae. 23. Epigynum. 24–25. Female from Beaufort, Carteret Co., North Carolina, 25 Jan. 1952. 24. Spermathecae. 25. Epigynum.

Figs. 26–27. *Trochosa gosiuta* Chamberlin, female from Timpanogos Park, American Fork Canyon, Salt Lake Co., Utah, 13 June 1941. 26. Spermathecae. 27. Epigynum. *b*, bulb of spermathecae; *ms*, median septum; *s*, spermathecae; *tp*, transverse piece.

1959, ♂ (J. C. Bequaert). Jasper Co.: Jasper, 5 Feb. 1962, ♀ (Science Club). Walker Co.: Huntsville, 2 Oct. 1950, ♂oo (W. J. Gertsch). Wichita Co.: Burkburnett, 12 Oct. 1964, 3♂♂:♀♀:o (K. W. Haller).

Trochosa gosiuta (Chamberlin)

Figures 4, 26, 27, 44-46. Map 2.

Lycosa avara var. *gosiuta* Chamberlin, 1908: 281, pl. 20, fig. 4, ♀. Female syntypes from Utah, lost. Petrunkevitch 1911: 556.

Lycosa gosiuta: Banks 1910: 56. Chamberlin and Gertsch 1928: 186. Chamberlin and Woodbury 1929: 140. Banks and Newport 1932: 31. Gertsch 1935: 20. Bonnet 1957: 2609.

Trochosa (Varacosa) gosiuta: Chamberlin and Ivie: 1942: 37.

Varacosa avara: Roewer 1954: 306.

Discussion. *Trochosa gosiuta* was first described by Chamberlin (1908) as a variety of *avara*. He indicated that females from Utah of this variety differed from *avara* in the shape of the epigynum. No type specimen was designated and the specimens from Utah upon which Chamberlin based the name *gosiuta* have apparently been lost.

Color. Females. Face orange-brown, yellowish along lower edge of clypeus. Eye nacelles black. Chelicerae brown to dark reddish brown.

Carapace orange-brown with broad median pale brownish yellow (golden) stripe, with dusky lines radiating from thoracic groove, and with brownish yellow submarginal stripes as in Figure 4.

Dorsum of abdomen pale brown ground color, freckled with numerous yellow and black spots, without distinct pattern as in Figure 4. Cardiac area light reddish brown. Venter pale brownish yellow with black spots laterally.

Legs pale yellow to brownish yellow, lighter ventrally.

Labium yellow, lighter yellow to cream distally. Endites brown with yellow distal ends. Sternum yellow.

Color. Males. Face pale yellow to orange-yellow. Lighter along lower edge of clypeus. Chelicerae pale yellow to golden. Eye nacelles black. Cymbium of palpus yellow.

Dorsum of abdomen pale brownish yellow with irregular spots of gray-brown or black without distinct pattern; venter pale yellow to cream with a few scattered gray to black spots laterally.

Legs light brownish yellow to pale yellow with ventral surface a lighter shade.

Labium and endites yellow with distal ends lighter yellow to cream. Sternum pale yellow to cream.

Measurements. Ten females and ten males from Utah.

Females:	Mean	Range		Mean	Range
Ant. Eye Row	.862	.78- .91	Femur I	3.32	2.8- 3.7
PME	1.031	.90- 1.10	Pat.-Tibia I	4.28	3.6- 4.8
PLE	1.346	1.21- 1.49	Meta. I	2.36	2.0- 2.7
POQ	.938	.85- .98	Tarsus I	1.50	1.4- 1.6
			Total I	11.45	9.9-12.9
Carapace					
Width	3.80	3.2 - 4.3	Femur IV	4.08	3.5- 4.5
Carapace					
Length	5.26	4.4 - 5.8	Pat.-Tibia IV	4.82	4.2- 5.4
Body Length	11.70	10.0 -13.0	Meta. IV	4.33	3.8- 4.8
Pat.-Tibia II	3.92	3.6 - 4.4	Tarsus IV	1.81	1.6- 2.0
Pat.-Tibia III	3.48	3.0 - 3.9	Total IV	15.04	13.2-16.4
Males:	Mean	Range		Mean	Range
Ant. Eye Row	.721	.70- .75	Femur I	2.72	2.5- 2.8
PME	.879	.84- .92	Pat.-Tibia I	3.58	3.4- 3.9
PLE	1.110	1.04- 1.16	Meta. I	2.18	2.0- 2.4
POQ	.808	.76- .89	Tarsus I	1.40	1.3- 1.5
			Total I	9.88	9.2-10.5
Carapace					
Width	3.02	2.8 - 3.2	Femur IV	3.42	3.2- 3.6
Carapace					
Length	4.20	3.9 - 4.5	Pat.-Tibia IV	4.19	3.8- 4.4
Body Length	8.50	7.4 - 9.4	Meta. IV	3.84	3.6- 4.0
Pat.-Tibia II	3.25	3.1 - 3.4	Tarsus IV	1.65	1.5- 1.8
Pat.-Tibia III	2.92	2.7 - 3.0	Total IV	13.09	12.2-13.7

Diagnosis. *Trochosa gosiuta* is similar to *avara* and *shenandoa* in size and coloration. Unlike the latter two species *gosiuta* specimens do not have the two dark dashes within the broad median stripe (compare Figs. 3 and 5 with Fig. 4). *Trochosa gosiuta* is most like *shenandoa* in the structure of the epigynum and the male palpal organ. The anteriorly directed ends of the transverse arms of the epigynum in *gosiuta* are narrower and less heavily sclerotized than in *shenandoa* (compare Fig. 27 with Figs. 18, 23, 25). The males of *gosiuta* can be most easily distinguished from *shenandoa* by the size and length of the ventral macrosetae on tibia I. These macrosetae



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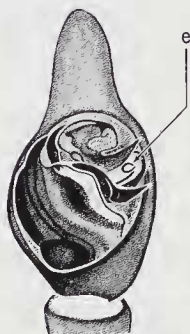
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are less well developed in *gosiuta* (compare Fig. 41 with Fig. 44). Also the distal paleal process (*p*) and the median apophysis (*ma*) of *gosiuta* (Figs. 45, 46) are less well developed than in *shenandoa* (Figs. 42, 43).

Natural History. *Trochosa gosiuta* occurs in relatively dry, desert regions in the western states. Nothing concerning its life style beyond this has been reported.

Distribution. From western Texas across New Mexico, Arizona, and southern California to northern Colorado, Utah, and Nevada (Map 2).

Records: *Texas.* Brewster Co.: Big Bend Nat. Pk., Chisos Basin, 6,000 ft., 25 Aug. 1967, ♂♀ (W. J. Gertsch); Chisos Mtns., 14 Dec. 1954, ♂ (K. W. Haller). *Colorado.* Boulder Co.: Boulder, Bluebell Canyon, 23 Oct. 1944, ♀ (R. E. Gregg); Green Canyon, 10 Oct. 1935, ♀ (M. Calvert); Gregory Canyon, 7–28 Oct., 1938, ♂♂:6♀♀ (V. Lanham), 20 Apr. 1965, ♀ (B., C. Durden); El Paso Co.: Colorado Springs, 3 June 1945, ♂♀ (R. E. Gregg); Larimer Co.: Fort Collins, 6,400 ft., 15 Sept. 1946, ♂♀ (C. C. Hoff). *Utah.* Carbon; Duchesne; Emery; Grand; Salt Lake; San Juan; Sevier; Tooele; Utah; Wasatch; Washington; Wayne. *New Mexico.* Bernalillo; Dona Ana; Eddy; Grant; Lincoln; Rio Arriba; Torrance; Valencia. *Nevada.* Clark Co.: Las Vegas, Bouldorado Ranch, 15 Oct. 1944, ♀ (D. J. Zinn). Churchill Co.: Churchill Crossing, 17 Oct. 1941, ♀. *Arizona.* Cochise; Coconino; Graham; Maricopa; Mohave; Navajo; Pima; Pinal; Santa Cruz. *California.* Imperial Co.: Salton Sea, Fish Springs, 12 Mar. 1941, ♀♀ (A., W. Ivie), Riverside Co.: Riverside, 25 June 1941, San Bernardino Co.: Mohave Desert, 1 Oct. 1938, ♀ (J. A. Anderson), Twenty-Nine Palms, 1–15 July 1945, ♀ (J. H. Branch).

Figs. 28–31. *Trochosa terricola* Thorell. 28–29. Male from Fruitland, Payette Co., Idaho, 10–25 Sept. 1941. 28. Left palpus, ventral view. 29. Left palpus, retrolateral view. 30–31. Male from South Meriden, New Haven Co., Connecticut, Jan.–May 1939. 30. Ventral view. 31. Retrolateral view.

Figs. 32–33. *Trochosa parthenus* Chamberlin, male from Alachua Co., Florida, 9 Nov. 1928. 32. Left palpus, retrolateral view. 33. Ventral view.

Figs. 34–35. *Trochosa shenandoa* Chamberlin and Ivie, male from Beaufort, Carteret Co., North Carolina, 25 Jan. 1952. 34. Ventral view. 35. Retrolateral view.

Figs. 36–37. *Trochosa avara* Keyserling, male from Ramsey, Bergen Co., New Jersey, 24 Sept. 1934. 36. Ventral view. 37. Retrolateral view. *e*, embolus.

Trochosa shenandoa Chamberlin and Ivie
Figures 5, 17, 18, 22-25, 34, 35, 41-43. Map 3.

Trochosa (Varacosa) shenandoa Chamberlin and Ivie, 1942: 37, fig. 78. Holotype female from Shenandoah National Park, Virginia (W78°:N38°40'), 5 July 1933, (W. Ivie) in American Museum of Natural History, examined. Vogel 1967: 109. *Varacosa shenandoa*: Roewer 1954: 307.

Discussion. This species was described from a single female collected in Shenandoah National Park. The nearest locality to that of the holotype where males have been collected is Beaufort, North Carolina. There is enough agreement between the holotype female (Figs. 22, 23) and those from North Carolina (Figs. 24, 25) to consider them conspecific. Males from North Carolina (Figs. 34, 35) when compared with males from Arkansas (Figs. 42, 43) appear identical. Arkansas females (Fig. 18) are certainly more different from the holotype (Fig. 23) than the Carolina specimens. It is possible that specimens described as *shenandoa* here represent a closely related group of species, but because of the similarities in internal genitalia (Figs. 17, 22, 24) and likenesses in the aforementioned males (compare Figs. 34, 35 with Figs. 42, 43) these specimens are regarded as a single species. Male specimens from Shenandoah National park should help to clarify the matter.

Color. Female. Face yellow-brown to orange-brown, lighter yellowish along lower edge of clypeus. Chelicerae orange-brown to dark reddish brown.

Carapace orange-brown to brown with wide pale yellow to yellow-orange median stripe; with median stripe enclosing two short, dark dashes anteriorly as in Figure 5, and with lighter irregular submarginal stripes.

Dorsum of abdomen pale yellow to light brown in ground color with dark brown or gray spots as in Figure 5. Cardiac area solid brown. Faint pattern of chevrons posteriorly in some specimens. Venter cream to pale yellow with a few scattered darker spots.

Legs yellow to yellow-orange, with ventral surface lighter.

Labium and endites orange to orange-brown with distal ends yellow. Sternum yellow.

Color. Male. Face yellow-orange to brownish orange, paler yellow along lower edge of clypeus. Chelicerae yellow-orange to brownish orange. Cymbium of palpus yellow-orange with dark sclerites showing through integument.

Carapace light medium brown with broad median stripe of pale yellow-orange. Dashes within median stripe only faintly visible. Submarginal stripes paler.

Dorsum of abdomen pale yellow to light orange in ground color, heavily mottled with gray-brown. Cardiac area solid brown outlined in gray. Venter cream colored with a few scattered spots.

Legs pale yellow-orange to orange.

Labium and endites yellow-orange with distal ends yellow to cream. Sternum yellow.

Measurements. Ten females and ten males from North Carolina.

Females:	Mean	Range		Mean	Range
Ant. Eye Row	.770	.65- .85	Femur I	2.81	2.2- 3.2
PME	.936	.79- 1.02	Pat.-Tibia I	3.05	2.8- 3.9
PLE	1.186	.99- 1.29	Meta. I	2.03	1.6- 2.3
POQ	.851	.68- .89	Tarsus I	1.37	1.0- 1.5
			Total I	9.76	7.6-10.9
Carapace					
Width	3.11	2.4 - 3.4	Femur IV	3.37	2.6- 3.8
Carapace					
Length	4.44	3.4 - 5.0	Pat.-Tibia IV	4.02	3.1- 4.4
Body Length	10.46	7.8 -11.6	Meta. IV	3.70	3.0- 4.1
Pat.-Tibia II	3.20	2.5 - 3.5	Tarsus IV	1.66	1.2- 1.9
Pat.-Tibia III	2.90	2.4 - 3.2	Total IV	12.76	10.0-14.3
Males:	Mean	Range		Mean	Range
Ant. Eye Row	.714	.65- .75	Femur I	2.85	2.6- 2.9
PME	.876	.84- .90	Pat.-Tibia I	3.78	3.5- 3.9
PLE	1.120	1.00- 1.24	Meta. I	2.56	2.4- 2.6
POQ	.799	.76- .88	Tarsus I	1.44	1.4- 1.5
			Total I	10.62	10.0-11.6
Carapace					
Width	2.96	2.8 - 3.1	Femur IV	3.36	3.2- 3.5
Carapace					
Length	4.21	3.9 - 4.7	Pat.-Tibia IV	4.10	3.9- 4.2
Body Length	8.10	7.5 - 8.4	Meta. IV	3.94	3.8- 4.0
Pat.-Tibia II	3.32	3.0 - 3.4	Tarsus IV	1.78	1.5- 1.9
Pat.-Tibia III	2.94	2.8 - 3.0	Total IV	13.19	12.3-13.6

Diagnosis. *Trochosa shenandoa* is closest to *T. gosiuta* in epigynal structure. The anteriorly directed arms of the transverse piece (*tp*) of the median septum (*ms*) in *shenandoa* are longer and more

heavily sclerotized (compare Figs. 18, 23, 25 with Fig. 27). Internally the ducts of the spermathecae run nearly horizontally or straight across as they leave the bulb (*b*) in *shenandoa* (figs., 17, 22, 24), while in *gosiuta* the ducts slope diagonally posteriad as they leave the bulb (Fig. 26). The male palpus of *shenandoa* is most similar to that of *avara*. However, the median apophysis (*ma*) in *avara* is much larger than in *shenandoa* (compare Figs. 36, 37, 39, 40 with Figs. 34, 35, 42, 43). *Trochosa shenandoa* males may be easily distinguished from *avara* and *gosiuta* by the very robust pair of retroventral macrosetae on tibia I (compare Fig. 41 with Figs. 38, 44).

Distribution. Eastern coast of the United States southward along the Gulf Coast and inland in the central states. Single records from Quebec and Illinois (Map 3).

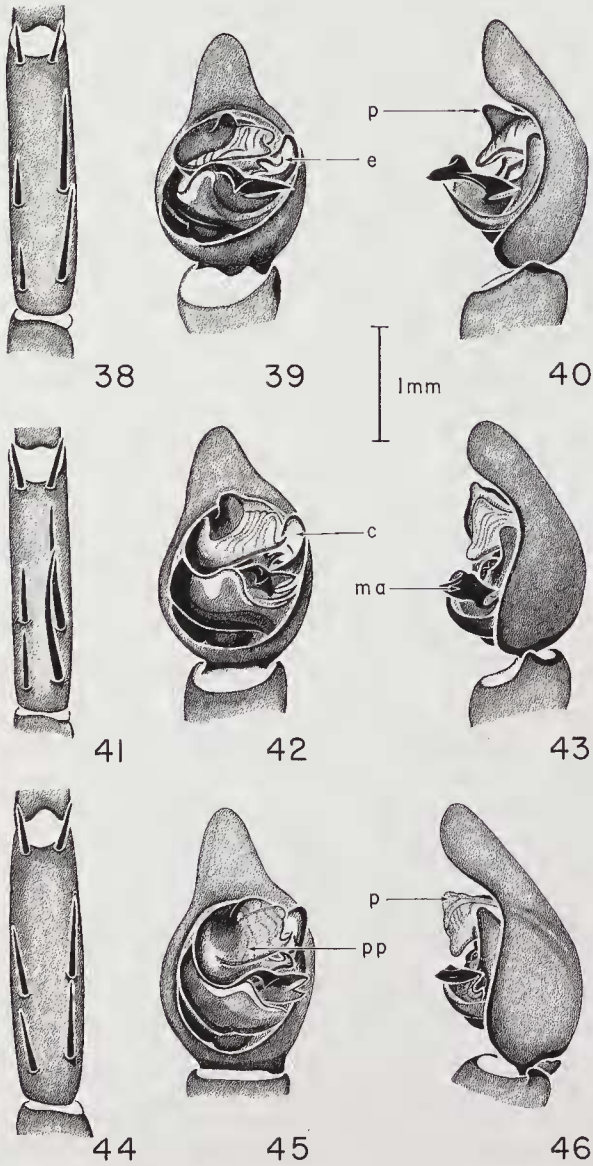
Records. CANADA. Quebec. Lanoraie, 5 July 1915, ♀ (J. I. Baeulne).

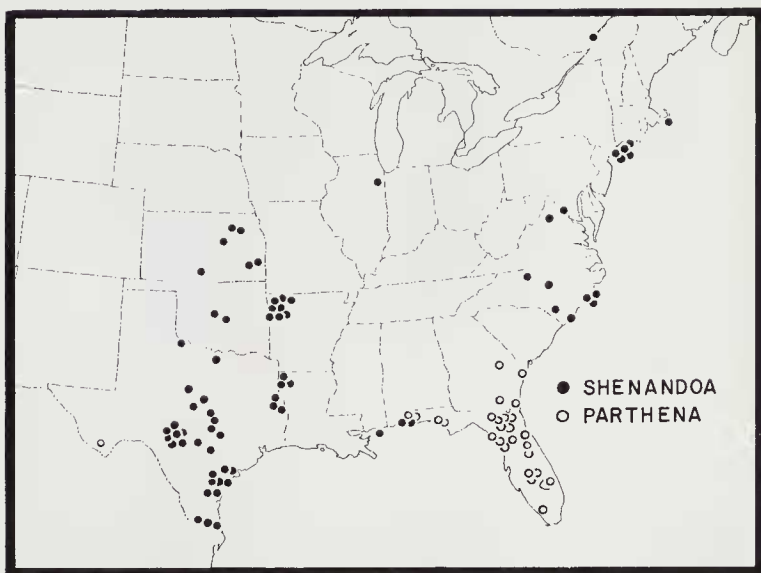
UNITED STATES. *Massachusetts.* Nantucket Co.: Nantucket, 20 Sept. 1892, ♂ (S. Henshaw). *New York.* Nassau; Suffolk. *Virginia.* Falls Church (Indep. City), ♀♀ (N. Banks); Shenandoah National Park, 5 July 1933, ♀ (W. Ivie). *North Carolina.* Bladen; Carteret; Guilford; New Hanover; Wake. *Florida.* Escambia Co.: Pensacola, 31 Jan. 1935, ♀. *Alabama.* Baldwin Co.: Gasque, 1950, ♀ (A. F. Archer). *Mississippi.* Harrison Co.: Ship Island, 16 Mar. 1936, ♀♀. *Louisiana.* Caddo Par.: Shreveport, 1-2 Nov. 1936, ♂♂ (H. K. Wallace). *Illinois.* Kankakee Co.: Pembroke, 19 May 1934, ♀ (D. C. Lowrie). *Arkansas.* Carroll; Washington. *Kansas.* Bourbon; Dickinson; Kingman; Riley; Woodson. *Oklahoma.* Canadian; Cleveland. *Texas.* Aransas; Bandera; Bastrop; Bell; Cameron; Comanche; Coryell; Denton; Hidalgo; Jasper; Jim Wells; Kendall; Kerr; Kleberg; Refugio; San Patricio; San Saba; Shelby; Travis; Victoria; Wilbarger.

Figs. 38-40. *Trochosa avara* Keyserling. 38. Male from Cove Creek, Washington Co., Arkansas, 30 Dec. 1956, ventral view of left tibia I. 39-40. Syntype from North America. 39. Left palpus, ventral view. 40. Left palpus, retrolateral view.

Figs. 41-43. *Trochosa shenandoa* Chamberlin and Ivie, male from Cove Creek, Washington Co., Arkansas, Feb. 1957. 41. Ventral view of left tibia I. 42. Ventral view. 43. Retrolateral view.

Figs. 44-46. *Trochosa gosiuta* Chamberlin, male from Salt Lake City, Salt Lake Co., Utah, July-Sept. 1931. 44. Ventral view of left tibia I. 45. Ventral view. 46. Retrolateral view. *c*, conductor; *e*, embolus; *ma*, median apophysis; *p*, palea; *pp*, pars pendula.





Map 3. Collection localities for *Trochosa shenandoa* and *T. parthena*.

Trochosa parthenus (Chamberlin)

Figures 6-9, 32, 33. Map 3.

Lycosa parthenus Chamberlin, 1925: 228. Holotype female from Bartow, Polk Co., Florida (R. V. Chamberlin) in the Museum of Comparative Zoology, examined.

Gertsch and Wallace 1935: 12, figs. 28, 29, ♀♂. Wallace 1947: 37.

Trochosa (Varacosa) parthenus: Chamberlin and Ivie 1942: 37.

Varacosa parthenus: Roewer 1954: 306.

Lycosa parthena: Bonnet, 1957: 2657.

Discussion. According to H. Don Cameron (personal communication) the specific name *parthenus* is a Latinization of the Greek noun "parthenos" meaning virgin. As such *parthenus* is a noun in apposition to *Trochosa* and is the correct form of the species name.

Color. Female. Face yellow-orange to orange-brown, lighter along lower edge of clypeus. Chelicerae yellow-orange to dark reddish brown.

Carapace light brown to dark reddish brown with a light yellow to pale orange median stripe, with two dark oblong spots within the median stripe anteriorly as in Figure 6, and with light submarginal stripes.

Dorsum of abdomen with yellowish ground color heavily pigmented with dark brown or gray producing a pattern as in Figure 6. Venter cream to pale yellow with scattered dark spots, heaviest along sides.

Legs pale yellow to yellow-orange with dusky markings, which are more prominent dorsally.

Labium and endites yellow to light brown with distal ends cream. Sternum cream to yellow.

Color. Male. Face light orange-brown, yellowish along lower edge of clypeus. Chelicerae yellow-orange to light orange-brown. Cymbium of palpus yellow-orange with dark sclerites visible through integument.

Carapace orange-brown to brown with wide median yellow stripe, with two dark spots within median stripe anteriorly as in female, and with lighter irregular submarginal stripes not as distinct as in female.

Dorsum of abdomen medium brown produced by yellowish ground color speckled with dark brown or gray spots. Cardiac area solid yellowish brown to brown. Venter cream to pale yellow with a few to many scattered dark spots.

Legs yellow to light brownish yellow with dusky markings above.

Labium and endites yellow, lighter distally. Sternum yellow.

Measurements. Ten females and ten males from Florida.

Females:	Mean	Range		Mean	Range
Ant. Eye Row	.728	.66- .82	Femur I	2.46	2.2- 2.8
PME	.876	.80- 1.00	Pat.-Tibia I	3.16	2.8- 3.6
PLE	1.100	1.01- 1.24	Meta. I	1.74	1.4- 2.0
POQ	.799	.72- .94	Tarsus I	1.16	1.0- 1.4
			Total I	8.48	7.1- 9.8
Carapace					
Width	2.82	2.5 - 3.4	Femur IV	3.00	2.5- 3.4
Carapace					
Length	3.92	3.5 - 4.7	Pat.-Tibia IV	3.70	3.2- 4.2
Body Length	8.64	7.6 - 9.4	Meta. IV	3.38	3.0- 3.8
Pat.-Tibia II	2.92	2.5 - 3.4	Tarsus IV	1.50	1.4- 1.6
Pat.-Tibia III	2.65	2.2 - 3.0	Total IV	11.58	10.0-13.0

Males:	Mean	Range		Mean	Range
Ant. Eye Row	.631	.60- .66	Femur I	2.38	2.2- 2.7
PME	.790	.74- .94	Pat.-Tibia I	3.18	2.8- 3.6
PLE	.984	.91- 1.09	Meta. I	2.03	1.8- 2.4
POQ	.701	.66- .76	Tarsus I	1.20	1.1- 1.4
			Total I	8.82	8.0-10.0
Carapace					
Width	2.60	2.4 - 3.0	Femur IV	2.84	2.5- 3.2
Carapace					
Length	3.56	3.2 - 4.0	Pat.-Tibia IV	3.56	3.2- 4.0
Body Length	6.67	5.8 - 7.6	Meta. IV	3.44	3.0- 3.8
Pat.-Tibia II	2.86	2.5 - 3.2	Tarsus IV	1.53	1.4- 1.8
Pat.-Tibia III	2.61	2.4 - 3.0	Total IV	11.37	10.0-12.9

Diagnosis. *Trochosa parthenus* resembles *shenandoa* and *gosiuta* in epigynal structure, but it can be easily distinguished from these two species (compare Figs. 8, 9 with Figs. 18, 23, 25, 27). The male palpal organ of *parthenus* (Figs. 32, 33) is most similar to that of *shenandoa* (Figs. 34, 35, 42, 43), but again can be readily distinguished. *Trochosa parthenus* is the smallest member of the *avara* species group, averaging considerably smaller in size than *avara*, *gosiuta*, or *shenandoa* (see *Measurements*). This species is also the only member of *Trochosa* occurring in peninsular Florida. Even though there is a single male specimen recorded from near Alpine, Texas, *parthenus* seems to be largely restricted to the southeastern United States.

Natural History. Wallace (1947) reported on the natural history of this species in Florida:

"*Lycosa parthenus* matures and mates during January and February in the Gainesville region; however, I have two records of males from October. Females with egg sacs have been taken only during January and February. During the spring adults gradually decrease in numbers until, by the middle of the summer, they are rare. By June the young have left the mother and are common in the leaf mould of appropriate situations.

This species is apparently confined to dry leaf mould. In such xeric situations as turkey oak or old fields it is found among the leaves under trees but is missing on open sandy stretches. Whenever dry leaf mould occurs, including all situations drier than mesophytic hammock, this species is likely to be present."

Distribution. Southeastern United States. One male from western Texas.

Records. Georgia. Chatham Co.: Savannah Beach, 5 Dec. 1962, 3♂♂:3♀♀ (W. Ivie); Emanuel Co.: N of Swainsboro, 23 Dec. 1962, ♂ (W. Ivie); Ware Co.: 15 mi. W of Waycross, 22 Dec. 1962, ♀ (W. Ivie). *Florida.* Alachua; Bay; Citrus; Clay; Collier; Escambia; Highlands; Lake; Levy; Martin; Nassau; Orange; Pinellas; Putnam; Seminole; Volusia. *Texas.* Brewster Co.: 10 mi. W of Alpine, 28 Nov. 1946, ♂ (H. K. Wallace).

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